

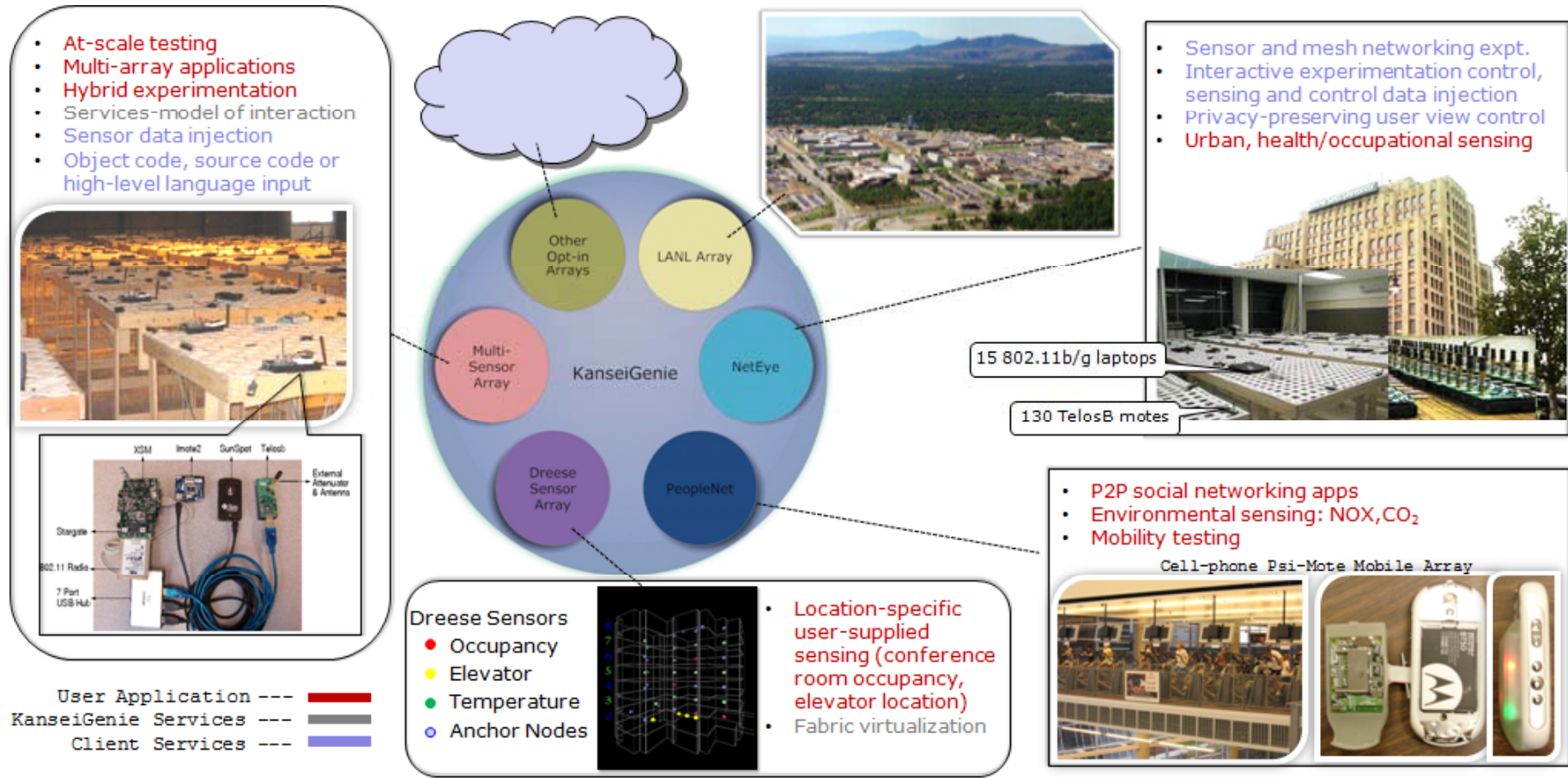
Federation Roadmap for KanseiGenie

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Nov 16, 2009



KanseiGenie Overview



KanseiGenie Experiments by Outside Researchers

- Kansei

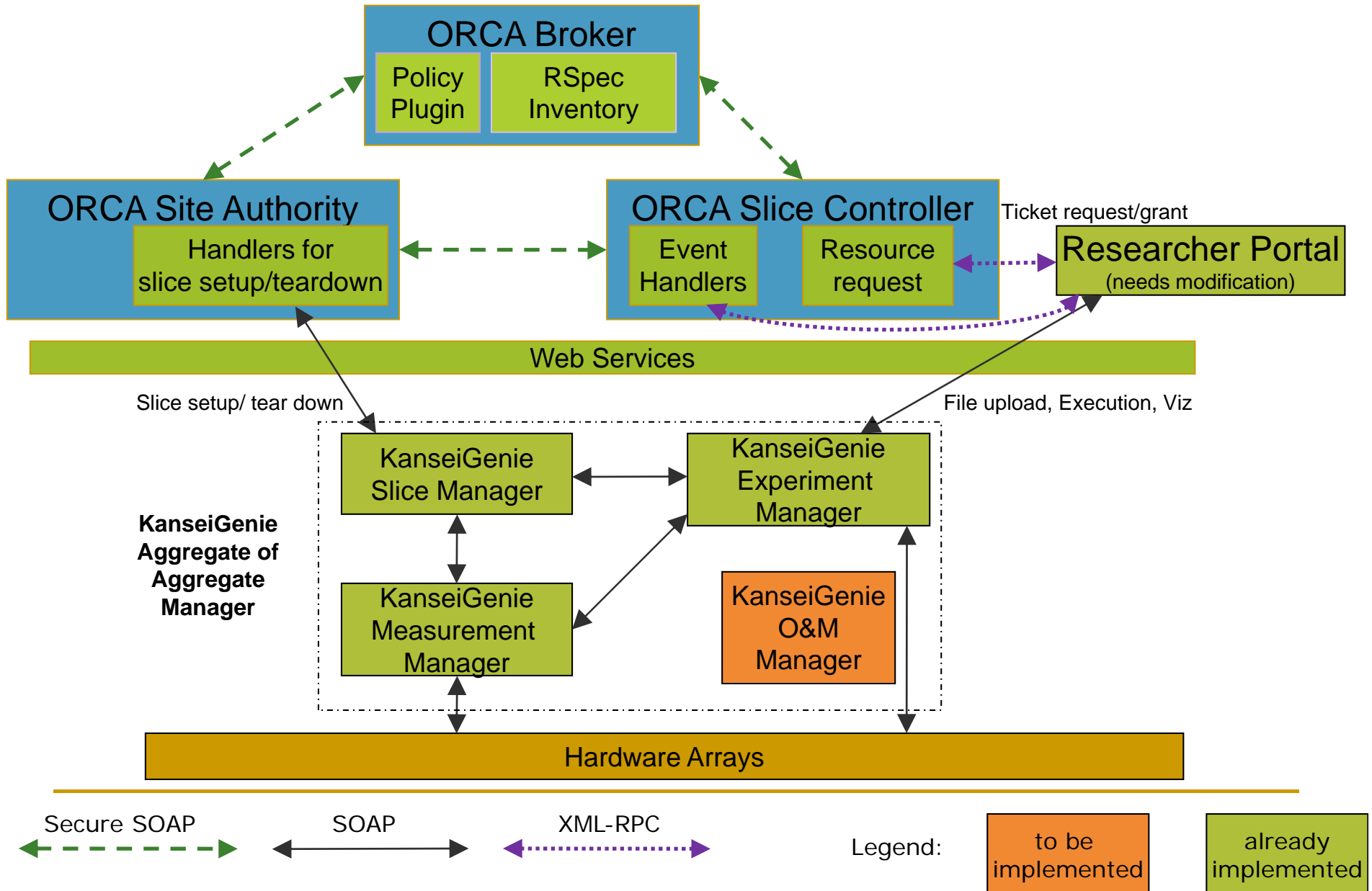
- 800 experiments since May, 2008
- UCLA
- Northwestern
- UT, Dallas
- ICT, Australia
- Michigan State
- Wayne State
- SUNY, Buffalo

- NetEye

- 400 experiments since October, 2008
- Michigan State
- USC
- Stanford
- SUNY -Buffalo
- City University of Hong Kong
- University of Sci. & Tech., China
- Southeastern University, China

- Several groups at OSU use Kansei for research & education
- Cloning under progress by Oklahoma State
- In Spiral 2, we are motivated by our own federation scenarios and facilitating federated experiments with other sites
 - Seamless Regression Testing: different radios, different scales, different backgrounds

KanseiGenie Federation Architecture/Status



KanseiGenie Federation Plan

- Two major aspects
 - Resource management: discovery, allocation
 - Experiment stitching
- Federated resource management for spiral 2
 - Federated resource manager (FR)
 - FR at researcher portal
 - No requirement for broker-broker interaction
 - Supported by today's ORCA implementation
 - Researcher portal may not be able to directly talk to all the brokers around the globe (in the long term)
 - Wireless Sensor Network RSpec and Experiment Spec

KanseiGenie Federation Plan (cont.)

- Experiment stitching for spiral 2
 - Also at the researcher portal
 - Federated experiment control: configuration, monitoring, etc
 - Enabled by resources acquired through FR
 - Implemented by experiment control modules at researcher portal and sites

KanseiGenie Federation Plan (cont.)

- Alternative solution : place FR at broker
 - *Enable experimentation across multiple trust domains*
 - Requires broker-broker interaction
 - Smooth transition via well-defined FR interfaces
- ORCA features required
 - Automatic resource delegation from site authority to brokers
 - Resource delegation between brokers

Spiral 2 Milestones

1. Port v1.0 KanseiGenie installer on NetEye
 - Accommodate new substrate
 - Port hierarchical AM/CM to new substrate
2. Extend KanseiGenie researcher portal to multiple sites for federation use
 - Experiment interaction user service v1.0
 - Support experiment workflow management
3. Basic federated resource discovery and experiment scheduling
 - Jointly with ORCA-BEN and Cluster D
 - Authentication across brokers for federated slices (ORCA chaining mechanism/policy extensions?)
4. Share KanseiGenie RSpec and experiment spec
5. Realize v2.0 of software package installer, incl. basic federation
6. Support open use of federation use cases

Federation Roadmap for KanseiGenie

Thank you

Questions?

Internet 2 Connection

- OSU
 - Layer 3 connection to I2 available currently and free of cost
 - L2 VLAN connection to I2 is feasible via OARnet
 - OARnet has agreed in principle to not charge for VLAN (<200Mbps)
 - Paul Schopis (CTO OARnet) working with Matt Z of I2 to figure out bandwidth allocation details w.r.t I2 and GENI
 - Also exploring Layer 2 connections to NLR via Pittsburgh
- WSU (via MERIT)
 - Layer 3 connection to I2 available currently and free of cost
 - L2 costs unaffordably high: ~30K/year
- In Spiral 2, experiments between OSU and WSU on L3
- But end-to-end GENI experiments will be feasible

Resource and Experiment Specification

- Our approach : Bottom-up
 - Different ontology models at different sites
 - standardized language
- Researcher portal (RP) as the unifying agent
 - Why? RP is the only actor researchers interact with
 - Translate RP specific RSpecs to site specific ones
- Unique challenges from wireless fabrics
 - Node / Link / Network

Federation Demo

- Federated regression testing
 - Network interference model -> channel capacity
 - disk graph, dual disk graph, geometric, SINR model
 - Regression testing for interference control based on theoretical channel capacities